

NT-P014

Bio-functionalization of the Single Layer Graphene for Detecting the Cancer Cell

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We present a method of surface functionalization of a single layer graphene for linking and detecting MDA-MB-231 human breast cancer cell. The methodology is done by utilizing 1-pyrenebutanoic acid and succinimidyl ester for immobilizing CD44 antibodies. This work shows that the single layer graphene is an efficient fixing substance to capture the MDA-MB-231 human breast cancer cell, selectively. The immobilization method of the cancer cell on the graphene layer will be an effective cell counting system. Moreover usage of the linking with non-covalent bonding is expected to develop a sensor scheme of electrical cell-detecting diagnosis system.

Keywords: graphene, MDA-MB-231, sensor, antibody

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Fabrication Thermal Responsive Tunable ZnO-stimuli Responsive Polymer Hybrid Nanostructure

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ZnO nanowire is known as synthesizable and good mechanical properties¹. And, stimuli-responsive polymer is widely used in the application of tunable sensing device². So, we combined these characteristics to make precise tunable sensing device. In this work, we investigate the dependence of ZnO nanowire alignment and morphology on si substrate using nanosphere template with various conditions via hydrothermal process. Also, pH-temperature dependant tuning ability of nanostructure was studied. The brief experimental scheme is as follow. First, ZnO seed layer was coated on a si wafer (20×20 mm) by spin coater. And then 1.15 μm sized close-packed PS nanospheres were formed on a cleaned si substrate by using gas-liquid-solid interfacial self-assembly method. After that, zinc oxide nanowires were synthesized using hydrothermal method. Before the wire growth, to specify the growth site, heat treatment was performed. Finally, NIPAM(N-Isopropylacrylamide) was coated onto as-fabricated nanostructure and irradiated by UV light to form the PNIPAM network. The morphology, structures and optical properties are investigated by FE-SEM(Field Emission Scanning electron Microscopy), XRD(X-ray diffraction), OM(Optical microscopy), and WCA(water contact angle).

References

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Keywords: nanosturcture, nanowire, ZnO, thermal responsive polymer